Characteristics of rice husk biochar blended with coal fly ash for potential sorption material

ABSTRACT

Biochar has received a great attention recently due to abundant biomass left in Malaysia. Besides that, the application of biochar in environmental aspects widely used in the world to improvise soil fertility and water quality. In this research, biochar is produced from rice husk (RH) by pyrolysis at 500 °C using fixed-bed tube reactor. Then the biochar will be blended with coal fly ash (CFA) using the ratio of rice husk biochar (RHB) to CFA (0.2:0.8, 0.5:0.5, and 0.8:0.2) to be further analyzed on their characteristics. From proximate analysis, the ash content is increasing while moisture content, volatile matter, and fixed carbon decrease as the ratio are decrease. For determination of carbon, hydrogen, oxygen, nitrogen and sulphur, the result from ultimate analysis indicates that hydrogen, carbon and nitrogen increase as the ratio increases. Based on the BET result, the surface area is increase proportionally to the ratio (0.2:0.8, 0.5:0.5, 0.8:0.2). Based on this research, RHB has a great potential to be applied as an adsorbent. However, blended RH with CFA are not giving desire result to be used an adsorbent. It is believed that introduction of CFA will offer some magnetic effect to the sorbant to attract pollutants.

Keyword: Biochar; Biomass; Coal fly ash; Pyrolysis; Rice husk